

EL10. The Clinical Applications of Co-Registration Techniques in Nuclear Medicine

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Co-registration of functional nuclear medicine images with predominantly anatomical data from MR and CT is increasingly finding an important role for clinical imaging. Co-registration may be important to determine the functional or metabolic significance of structures identified in anatomical images or to localise the exact site of radiotracer accumulation when the anatomical information on the nuclear medicine scan is insufficient. This localisation becomes progressively important as the target to non-target ratio which is an important goal of nuclear medicine becomes higher. Co-registered images also have a potentially important role in teaching and for the developing of new diagnostic images by combining the data contained in more than one image set. Methods for achieving co-registration include the co-location of the imaging devices, the use of external markers visible by both techniques, the use of internal anatomical co-located landmarks, auto-

matic and semi-automatic methods and manual techniques. Co-registration methods apply to both two dimension and three dimensional datasets and may use planar imaging, SPECT imaging or PET studies. We have developed several methods which have been introduced into the clinical diagnostic service for co-registration which include bone scans with x-rays, co-registration of PET and SPECT brain scans with MR and CT; head and neck malignancies for the co-registration of FDG PET scans with MR and CT of the head and neck, SPECT scans of the head and neck with MR in medullary carcinoma and co-registration of FDG scans of the pelvis with CT for patients with pelvic carcinomas.

The methodologies and clinical evaluation of these techniques in routine clinical use will be presented and discussed.